LEADORE SCHOOL (PWS 7300022)
SOURCE WATER ASSESSMENT FINAL REPORT

May 13, 2003

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated source water assessment area and sensitivity factors associated with the well and aquifer characteristics.

This report, *Source Water Assessment for the Leadore School, Leadore, Idaho,* describes the public drinking water systems (PWSs), the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The Leadore School drinking water system (PWS #7300022) is a non-transient, non-community system that consists of one well. The well has high susceptibility to all potential contaminant categories: inorganic chemical (IOC) contaminants, volatile organic chemical (VOC) contaminants, synthetic organic chemical (SOC) contaminants, and microbial contaminants. According to the 1996 Ground Water Under Direct Influence (GWUDI) field survey, a septic system line runs within 50 feet of the wellhead, impinging upon the sanitary setback (a 50-foot radius) of the well, resulting in an automatic high susceptibility to IOCs and microbials. The well has high scores for hydrologic sensitivity and system construction, contributing greatly to the overall susceptibility of the system.

Total coliform bacteria were detected in the distribution system in September and October 1999 with no confirmed detections. No bacteria have been detected at the Leadore School well. No SOCs or VOCs have been detected in the water system. The IOCs nitrate, barium, and fluoride were detected in the well but at levels far below the maximum contaminant levels (MCLs) set by the EPA. Sodium, an unregulated IOC, was also detected in the well water.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the Leadore School’s drinking water well, water protection activities should focus on correcting any deficiencies outlined in the sanitary surveys (inspections conducted every five years with the purpose of determining the physical condition of a water system’s components and its capacity). No chemicals should be stored or applied within the 50-foot radius of the wellheads. The Leadore School may need to consider moving the septic system line that runs within 50 feet of the wellhead to avoid contamination associated with this contaminant source or possibly consider installing another ground water well that is located in a more protected spot. Since much of the designated protection areas are outside the direct jurisdiction of the Leadore School, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation areas are near residential land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (e.g. zoning, permitting) or non-regulatory in nature (e.g. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR THE LEADORE SCHOOL, LEADORE, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the rankings of this assessment mean.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment is also included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the EPA to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The public drinking water system for the Leadore School is comprised of one ground water well that serve approximately 140 people through three connections. Situated in Lemhi County, the well is located on the southwest edge of the city within 100 feet of the Leadore School (Figure 1).

There are no current significant potential water problems affecting the Leadore School drinking water system. Total coliform bacteria were detected in the distribution system in September and October 1999 with no confirmed detections. No bacteria have been detected at the Leadore School well. No SOCs or VOCs have been detected in the water system. The IOCs nitrate, barium, and fluoride were detected in the well but at levels far below the MCLs set by the EPA. Sodium, an unregulated IOC, was also detected in the well water.

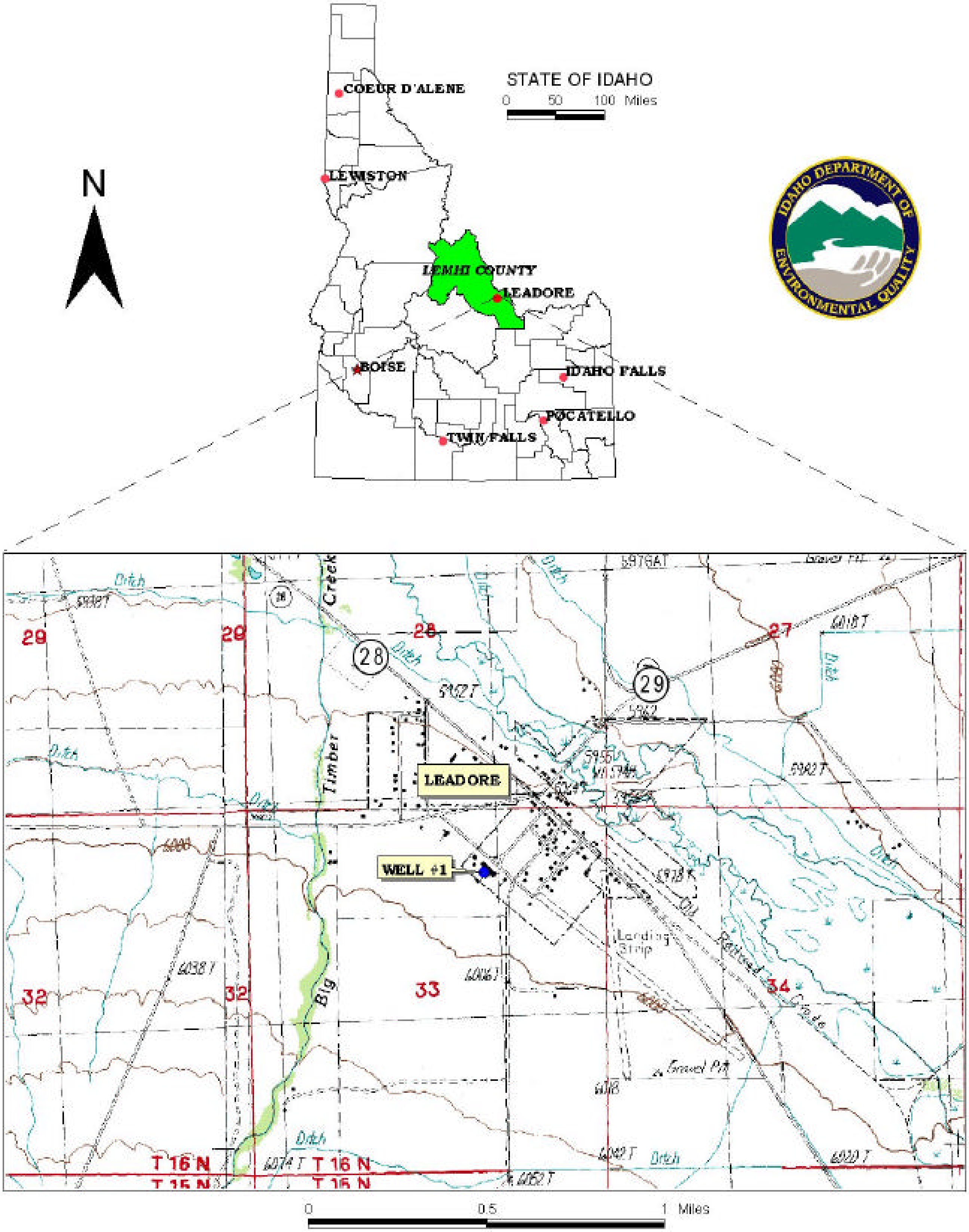
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with Washington Group, International (WGI) to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Lemhi Valley of the Upper Salmon River hydrologic province aquifer in the vicinity of the well of the Leadore School. The computer model used site specific data, assimilated by WGI from a variety of sources including the Leadore School operator input, local area well logs, and hydrogeologic reports (detailed below).

Hydrogeologic Conceptual Model

The Upper Salmon River Basin occupies approximately 1,170 square miles in east-central Idaho. The basin is included in the Northern Rocky Mountain geomorphic province, which is characterized by high massive mountains and intermontane valleys with variably thick accumulations of sediment (Parliman, 1982, p. 4). The basin includes four hydrologic provinces: Lemhi Valley, Pahsimeroi Valley, Round Valley, and Upper Salmon River. The Round Valley and Upper Salmon River provinces are drained by the Salmon River, while the Lemhi and Pahsimeroi provinces are drained by the Lemhi and Pahsimeroi rivers, which are northwest flowing tributaries of the Salmon River. Surface water/ground water interactions in the basin's valleys are complex. However, upper river reaches generally recharge the valleys aquifers, while the lower river reaches receive the aquifers discharge (Parliman, 1982, p. 13).

FIGURE 1. Geographic Location of Leadore School



The Lemhi Valley hydrologic province is a northwest trending basin located between the Lemhi Range to the southwest and the Beaverhead Mountains to the northeast. Annual precipitation is 7 inches on the valley floor and increases to over 42 inches on parts of the Lemhi Range (Donato, 1998, p. 3). The Lemhi River runs along the axis of the province with numerous tributaries draining the surrounding mountains. The headwaters of the river are formed at the confluence of Big Timber, Texas, and Eighteenmile creeks near the city of Leadore. The valley fill is primarily Quaternary aged gravel with intercalated sand and silt (Donato, 1998, p. 3). Alluvial deposits down basin from the town of Lemhi are generally less than 60 feet thick. The upper basin deposits exceed 200 feet in several places (Donato. 1998, p.3). A constriction zone occurs north of Lemhi where the bedrock has been uplifted, resulting in valley fill that is less than 20 feet thick and only 3,300 feet wide. The constriction zone forms a partial hydrologic barrier that effectively splits the aquifer in two (Spinazola, 1998, p. 3). The bedrock is composed primarily of metamorphic, volcanic, intrusive, and sedimentary rocks that are Middle Proterozoic to Tertiary in age (Donato, 1998, p. 3).

The valley-fill aquifer is recharged primarily through precipitation on the surrounding mountains. Seepage losses from surface water bodies and infiltration from irrigation, interaquifer flow, and septic tanks also provide recharge (Parliman, 1982, p. 13). Six of 14 measured reaches of the Lemhi River downstream from Leadore contribute to aquifer recharge after the irrigation season ends. During the irrigation season, all reaches are gaining from ground water with the exception of one, which loses an estimated 1 ft^3/sec/mi (Donato, 1998, Table 2).

Natural discharge of ground water occurs as river gains along the Lemhi River, evapotranspiration, and ground water underflow into the Upper Salmon River hydrologic province (Donato, 1998, pp. 11-18). Donato (1998, pp. 18-19) estimates aquifer discharge as underflow to be 500 to 3,000 acre-ft/yr using Darcy's equation and 7,415 acre-ft/yr using a water budget method.

The ground water flow direction is generally to the Lemhi River and north down the basin toward the confluence with the Salmon River at the city of Salmon (Donato, 1998, Figure 8). Estimates of hydraulic conductivity, based on analysis of specific capacity data using the method of Walton (1962, p.12), range from 27 to 116 ft/day with a geometric mean of 47 ft/day. The geometric mean hydraulic conductivity (47 ft/day) is comparable to values presented by Spinazola (22 ft/day; 1998, pp. 6-7) for an aquifer thickness of 16 feet and by Donato (40 ft/day; 1998, p. 18) for a cross section of the aquifer with an average thickness of 20 feet.

The Lemhi Valley hydrologic province includes the Leadore School well (PWS 7300022). The well is completed in an unconfined sand and gravel valley-fill aquifer that is underlain by a thick layer of clay. Leadore School well is 6 inches in diameter and 55 feet deep. The well casing is perforated between 46 and 53 feet below ground surface (ft-bgs).

Refined Method

The analytic element model WhAEM2000 (Kraemer et al., 2000) was used to delineate capture zones for the Leadore School well located in the Lemhi Valley hydrologic province. Model boundaries consist of constant-head line sinks representing the Lemhi River, Salmon River, Texas Creek, Eighteenmile Creek, and Big Timber Creek. Constant-flux line sinks backed by no-flow boundaries were placed on the basin's margin to represent aquifer recharge along the bedrock/valley-fill contact.

In the absence of published estimates of areal recharge or precipitation and evapotranspiration, an areal recharge value of 10 percent of the average annual precipitation on the valley floor (7 inches) was used. The geometric mean hydraulic conductivity value of 47 ft/day was used for simulating the base case aquifer conditions. The effective porosity is 0.3, which is the default value presented in Table F-3 of the Idaho Wellhead Protection Plan for unconsolidated alluvium (IDEQ, 1997, p. F-6). The aquifer thickness is 11 feet, which is equivalent to the average open interval of the PWS wells within the Lemhi Valley. Base elevation of the aquifer was set at 3,924 feet above mean sea level (ft msl), which is approximately 11 feet below the lowest stage of the Salmon River within the hydrologic province.

The final hybrid capture zones for Leadore School well trend southward extending approximately 2.8 miles in length (Figure 2). The total combined area for the Leadore School well is 1,270 acres. Capture zones terminate at the bedrock/valley-fill contact.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and others, such as *cryptosporidium*, and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

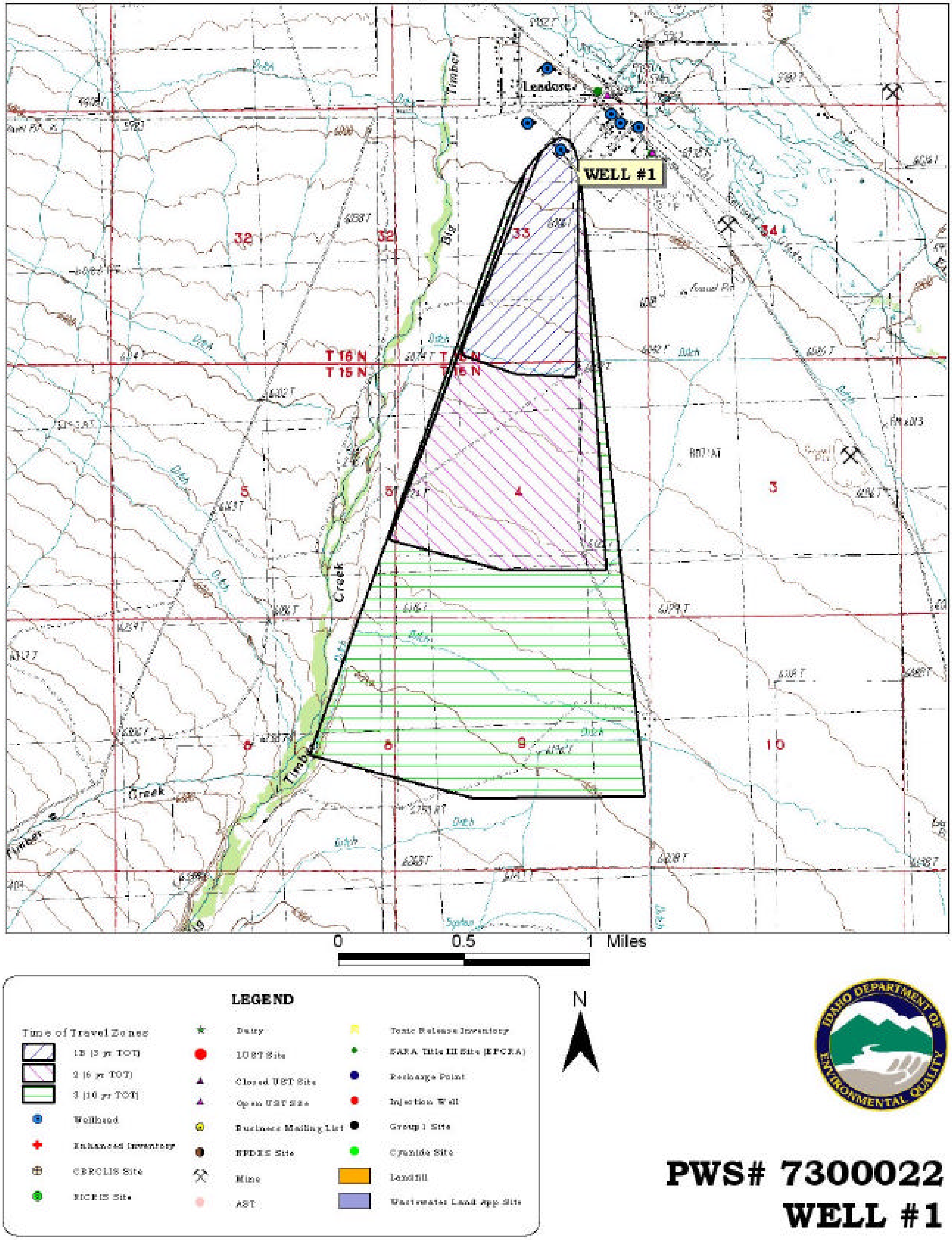
Land use within the immediate and surrounding areas of the Leadore School is mostly rangeland or undeveloped land use.

It is important to understand that a release may never occur from a potential source of contamination, provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in September and October 2002. The first phase involved identifying and documenting potential contaminant sources within the Leadore School Source Water Assessment Areas (Figure 2) through the use of field surveys, computer databases, and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the areas.

FIGURE 2. Leadore School Delineation Map and Potential Contaminant Source Locations



PWS# 7300022
WELL #1

The delineated source water area encompasses a southern trending corridor that extends for approximately 2.8 miles (Figure 2). The GIS map shows that the delineation for the well includes a few ditches, Big Timber Creek and a road (Figure 2). Additionally, the 1996 GWUDI field survey indicates that a septic line runs within 50 feet of the wellhead. A radius of 50 feet around the wellhead is known as the 1A zone or sanitary setback. Drinking water sources that have contaminants in this zone are considered highly vulnerable to contamination. The GWUDI survey also shows that a shop and the parking lot to the school are situated within 500 feet of the wellhead. Table 1 below lists the potential contaminants within each delineated area.

Table 1. Well of the Leadore School, Potential Contaminant Inventory

Site #	Source Description[1]	TOT ZONE[2]	Source of Information	Potential Contaminants[3]
	Ditch	0 – 3	GIS Map	IOC, VOC, SOC, Microbials
	Ditch	6 – 10	GIS Map	IOC, VOC, SOC
	Big Timber Creek	6 – 10	GIS Map	IOC, VOC, SOC
	Road	6 – 10	GIS Map	IOC, VOC, SOC
	Septic Line	0 – 3 (1A)	1996 GWUDI Survey	IOC, Microbials
	Shop	0 – 3	1996 GWUDI Survey	IOC, VOC, SOC
	Parking Lot	0 – 3	1996 GWUDI Survey	IOC, VOC, SOC, Microbials

[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead; 1A = sanitary setback of the well
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analysis

A well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. Each of these three categories carries the same weight in the final assessment, meaning that a low score in one category coupled with higher scores in the other categories can still lead to a overall susceptibility of high. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix A contains the susceptibility analysis worksheet for the system. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity rates high for the Leadore School well (Table 2). The soils contained within the boundaries of the delineation are in the moderate to well-drained soil class. Additionally, the well log indicates that the vadose zone of the well consists of gravel and boulders and no clay or silt layers, or other fine-grained sediments that hinder the downward migration of contaminants to the aquifer. First ground water is found between 30 and 35 feet below ground surface (bgs).

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in Sanitary Surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The Leadore School well was drilled in 1982 to a depth of 55 feet bgs. It has a 0.250-inch thick, six-inch diameter casing set to 55 feet bgs into gravel and sand. The annular seal of the well extends to a depth of 18 feet bgs into boulders and gravel. The highest producing zone of the well is found between 50 feet and 55 feet bgs and the static water level is found at 32 feet bgs. The well is screened from 46 to 53 feet bgs.

System construction of the Leadore School well rated highly susceptible to contamination. According to the 1996 sanitary survey, the wellhead and surface seals are maintained to standards and the well is properly protected from surface flooding. However, the well lacks a casing vent. The purpose of the vent is to vent the space between the casing and the column and prevent a vacuum from forming when the well turns on and draws down the water table. A vacuum could draw in contamination through joints or leaks in the casing or cause the well to slough. The annular seal and casing do not extend to low permeability units that would protect the well from contamination. The highest producing zone is not 100 feet or deeper below the static water level. Though the well is located outside a 100-year floodplain, the well casing is located below grade.

Though the well may have been in compliance with standards when it was completed, current public water system (PWS) well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. These standards include provisions for well screens, pumping tests, and casing thicknesses to name a few. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. A 6-inch diameter casing requires a thickness of 0.288 of an inch. The Leadore School well did not meet well construction standards and therefore, was assessed an additional point in the system construction rating.

Potential Contaminant Source and Land Use

The well of the Leadore School rates moderate for IOCs (e.g. nitrates arsenic), VOCs (e.g. petroleum products), and SOCs (e.g. pesticides), and it rates low for microbial contaminants (e.g. bacteria). The contaminant sources within the 3-year TOT zone contributed to the potential contaminant source/land use rating. However, the predominant rangeland or undeveloped land use within the delineation of the well is considered less contaminating and therefore reduced the land use score.

Final Susceptibility Ranking

A detection above a drinking water standard MCL, any detection of a VOC or SOC at the well, or a confirmed detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, if there are contaminant sources located within 50 feet of the source then the wellhead will automatically get a high susceptibility rating. According to the 1996 GWUDI field survey, a septic line runs within 50 feet of the wellhead, resulting in automatic high susceptibility scores for IOCs and microbial contaminants. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, the Leadore School well rated high for all potential contaminant categories.

Table 2. Summary of Leadore School Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	H	M	M	M	L	H	H(*)	H	H	H(*)

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
(*) = Automatic high susceptibility score due to a septic line that runs within 50 feet of the wellhead

Susceptibility Summary

Overall, the Leadore School well has high susceptibility to all potential contaminant categories: IOC contaminants, VOC contaminants, SOC contaminants, and microbial contaminants. According to the 1996 GWUDI field survey, a septic system line runs within 50 feet of the wellhead, impinging upon the sanitary setback (a 50-foot radius) of the well, resulting in an automatic high susceptibility to IOCs and microbials. The well has high scores for hydrologic sensitivity and system construction, contributing greatly to the overall susceptibility of the system.

Total coliform bacteria were detected in the distribution system in September and October 1999 with no confirmed detections. No bacteria have been detected at the Leadore School well. No SOCs or VOCs have been detected in the water system. The IOCs nitrate, barium, and fluoride were detected in the well but at levels far below the MCLs set by the EPA. Sodium, an unregulated IOC, was also detected in the well water.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the Leadore School's drinking water well, water protection activities should focus on correcting any deficiencies outlined in the sanitary surveys. No chemicals should be stored or applied within the 50-foot radius of the wellheads. The Leadore School may need to consider moving the septic system line that runs within 50 feet of the wellhead to avoid contamination associated with this contaminant source or install a new well that was located in a better protected location. Since much of the designated protection areas are outside the direct jurisdiction of the Leadore School, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any source water protection plan as the delineations are near to urban and residential land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. As there are transportation corridors through the delineations, the Idaho department of transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive source water assessment protection plan, be they regulatory in nature (e.g. zoning, permitting) or non-regulatory in nature (e.g. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office	(208) 528-2650
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us/

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper (mlharper@idahoruralwater.com), Idaho Rural Water Association, at 1-208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/L.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

District Seven Health Department. Drinking Water Supply Sanitary Survey for Leadore School, PWS #7300022. January 26, 1996.

District Seven Health Department. Ground Water Under Direct Influence Field Survey for Leadore School. April 1996.

Donato, M.M., 1998, Surface-Water/Ground-Water Relations in the Lemhi River Basin, East Central Idaho, United States Geological Survey, Water-Resources Investigations Report 98-4185, 20 p.

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Division of Environmental Quality, 1997, Idaho Wellhead Protection Plan, Idaho Wellhead Protection Work Group, February.

Idaho Division of Environmental Quality, 1999, Idaho Source Water Assessment Plan, October.

Kraemer, S.R., H.M. Haitjema, and V.A. Kelson, 2000, Working with WhAEM2000, Source Water Assessment for a Glacial Outwash Wellfield, Vincennes, Indiana, National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, EPA/600/R-00/022, April, 50 pp.

Parilman, D.J., 1982, Gound-Water Quality in East-Central Idaho Valleys, U.S. Geological Survey, Open File Report 81-1011.

Spinazola, J., 1998, A Spreadsheet Notebook Method to Calculate Rate and Volume of Stream Depletion by Wells in the Lemhi River Valley Upstream from Lemhi, Idaho, Bureau of Reclamation Pacific Northwest Region, Boise, Idaho, March, 19 p.

Walton, W.C., 1962, Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Department of Registration and Education, Bulletin 49, 81 p.

Appendix A

Leadore School Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : LEADORE SCHOOL   Well# : WELL #1
Public Water System Number 7300022   2/14/03 11:43:36 AM

1. System Construction

		SCORE
Drill Date	9/13/82	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1996
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well protected from flooding	NO	1
Total System Construction Score		6

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		6

3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	NO	NO	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0	0

Potential Contaminant / Land Use - ZONE 1B

		IOC	VOC	SOC	Microbial
Contaminant sources present (Number of Sources)	YES	3	3	3	2
(Score = # Sources X 2) 8 Points Maximum		6	6	6	4
Sources of Class II or III leacheable contaminants or	YES	3	3	3	
4 Points Maximum		3	3	3	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		9	9	9	4

Potential Contaminant / Land Use - ZONE II

		IOC	VOC	SOC	Microbial
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0

Potential Contaminant / Land Use - ZONE III

		IOC	VOC	SOC	Microbial
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0

	IOC	VOC	SOC	Microbial
Cumulative Potential Contaminant / Land Use Score	14	14	14	4
4. Final Susceptibility Source Score	15	15	15	14
5. Final Well Ranking	High	High	High	High